

Name Notes

Section 5.2

Algebra II: Systems of Equations—Solve by Substitution

Essential Questions:

Is there a more exact way to solve systems of equations than by graphing?

Substitution Example 1

- Use the following equations: $y+1=3x$ and $2x+y=9$
- Make sure one of the two equations is solved for Y or X, whichever is easier.

(a) $y+1=3x$
 -1
 $y=3x-1$

- Substitute the value of Y in the other equation. Then solve for X.

(b) $2x+(3x-1)=9$
 $2x+3x-1=9$ combine like terms
 $5x-1=9$
 $+1$ $+1$

 $\frac{5x}{5}=\frac{10}{5}$
 $x=2$

- Substitute your X value in one of the equations. Find the value of Y.

(b) $2(2)+y=9$
 $4+y=9$
 -4 -4
 $y=5$

(a) $y+1=3(2)$
 $y+1=6$
 -1 -1
 $y=5$

Check: Is $(2, 5)$ a solution for both equations?

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Substitution Example 2

- Use the following equations: $(X) = 2y$ and $(X) + y = 6$
- Make sure one of the two equations is solved for Y or X.

$$(a) X = 2y$$

- Substitute the value of X in the other equation. Then solve for ~~X~~ y

(b)

$$(2y) + y = 6$$

$$2y + y = 6$$

$$\frac{3y}{3} = \frac{6}{3}$$

$$y = 2$$

$$(a) X = 2(2)$$

$$X = 4$$

Check: Is $(4, 2)$ a solution for both equations?

$$(a) (4) = 2(2)$$

$$4 = 4$$

watch <http://www.youtube.com/watch?v=73TrgYVmX08>

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5.2 Systems Of Equations—Solve by substitution.

Solve by substitution.

1. $y = 4x$
 $x + y = 10$

2. $y = 3x$
 $x + y = 20$

3. $y = x - 2$
 $x + y = 12$

4. $x = 3y$
 $5y - x = 8$

5. $x = y + 2$
 $3y + x = 14$

E.C.
6. $y = -x + 3$
 $3y - 1 = 5x$

7. $y = 2x$
 $x + y = 9$

(b) $x + (2x) = 9$

$$x + 2x = 9$$

$$\frac{3x}{3} = \frac{9}{3}$$

$x = 3$

(b) $x + y = 9$

$$(3) + y = 9$$

$$\begin{array}{r} 3 + y = 9 \\ -3 \quad -3 \\ \hline \end{array}$$

$y = 6$

$(3, 6)$

8. $y = 2 - x$

(b) $3x + (y) = 8$

$$3x + (2 - x) = 8$$

$$3x + 2 - x = 8$$

$$\begin{array}{r} 2x + 2 = 8 \\ -2 \quad -2 \\ \hline \end{array}$$

$$\frac{2x}{2} = \frac{6}{2}$$

$x = 3$

(a) $y = 2 - (x)$

$$y = 2 - (3)$$

$y = -1$

$(3, -1)$